

Check out

You should now be able to ...

✓ Identify and understand square numbers.	5	1, 2
✓ Calculate and estimate square roots.	5	1, 3, 4
✓ Know the meaning of an index.	6	5, 6, 7
✓ Simplify expressions using indices.	6	8, 9
✓ Multiply and divide numbers by powers of 10.	6	10
✓ Write numbers in standard form.	6	11

Test it

Questions

7 Simplify each of these using indices.

- a $d \times d \times d$
 b $e \times e \times e \times e \times e$
 c $f \times f \times f \times f \times f \times f \times f$

8 Simplify these, write your answer using indices.

- a $3^2 \times 3^5$
 b $7^3 \times 7^8$
 c 11×11^4

9 Simplify these, write your answer using indices.

- a $r^6 \times r^5$
 b $s^4 \times s^9$
 c $t^{13} \times t$
 d $y^2 \times z^3$

10 Write these numbers in full.

- a 5.6×10^2
 b 2×10^5
 c 9.4×10^6

11 Write these numbers in standard form.

- a 4000
 b 76000
 c 83000000

1 Without using a calculator, find

- a 3^2 b 1^2 c 10^2
 d $\sqrt{36}$ e $\sqrt{81}$ f $\sqrt{64}$

2 Which of these are square numbers?

- 1 2 4 6
 8 9 12 16

3 This square has an area of 49 cm^2 .

What is the length of each of its sides?



4 A square has an area of 144 cm^2 .

What is its perimeter?

5 Find the value of each of these.

- a 4^3 b 5^4 c 3^6

6 Simplify each of these using indices.

- a $2 \times 2 \times 2 \times 2$
 b $6 \times 6 \times 6$
 c $7 \times 7 \times 7 \times 7 \times 7 \times 7$
 d 5



Language Meaning

Index notation	Using powers to show how many times a number has been multiplied by itself.	Example
Square number	A number which is equal to another number multiplied by itself.	$5 \times 5 \times 5 \times 5 = 5^4$ 49 is a square number because $49 = 7 \times 7$ 7 squared is written as 7^2
Square root	The square root of a number is the number you multiply by itself to get the number.	The square root of 144 is written as $\sqrt{144}$ $\sqrt{144} = 12$ as $12 \times 12 = 144$
Standard form	A way to write very large or very small numbers. A number in standard form starts with a number between 1 and 10 and is multiplied by a power of 10.	A large number in standard form looks like: $1340000000 = 1.34 \times 10^{10}$ A small number in standard form looks like: $0.00000056 = 5.6 \times 10^{-7}$

What next?

Score	0 - 4	Your knowledge of this topic is still developing. To improve look at Formative test: 3A-11; MyMaths: 1049, 1051 and 1053
5 - 9		You are gaining a secure knowledge of this topic. To improve look at InvisiPen: 181, 182 and 183
10 - 11		You have mastered this topic. Well done, you are ready to progress!